



The Intelligent Traveler

April 2013

INTELLIGENT TRANSPORTATION SYSTEMS - ITS

MDOT's Role in the World of Autonomous Vehicles

By: Matt Smith, P.E. ITS Program Manager



Thank you for reading another addition of our newsletter, spotlighting recent developments in MDOT's Intelligent Transportation System.

One of the bigger developments in the realm of transportation technology is the advent of automated (also known as autonomous or driverless) vehicles. This futuristic-sounding development has grabbed national media attention over the past few years. With all of the attention, there are many questions out there such as: How close is the technology to becoming a reality? And how does this impact road agencies like MDOT?

The technology is closer than most would

have ever thought possible. Many companies, from traditional automotive manufacturers to large international companies not usually thought of as transportation entities (such as Google) to smaller technology development companies based right here in Michigan, have been working on several components and technologies that will make automated vehicles a reality. While it may be decades before we see true "Jetsons-like" automated transportation networks, it's not unreasonable to think that automated vehicles will be on our roads within a five to 10-year time frame (or even sooner). Even today, automotive technology such as adaptive cruise control, lane-keeping systems and automated parking systems can be found in new cars on public roadways. >>

MDOT WEBSITE

www.michigan.gov/mdot

ITS PROGRAM OFFICE

www.michigan.gov/its

CONNECTED VEHICLES

www.michigan.gov/cv

MI DRIVE WEBSITE

www.michigan.gov/drive

MDOT ITS PLANNING

www.mdotitsplanning.com

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MDOT'S ITS MISSION:

"Develop and sustain a program at MDOT to improve safety, operational performance and integration of the transportation system utilizing Intelligent Transportation System technologies for economic benefit and improved quality of life."

What does this all mean to a transportation agency such as MDOT? Well, for an agency with a primary goal of ensuring the safety of the motoring public, we should all be excited by the potential future that these advancements promise. Most crashes involve some sort of human judgment element. Automated vehicles can help mitigate the impact of human error on crashes, dramatically improving safety on our roadways. MDOT has made fantastic strides over the past several years on reducing the crash, injury and fatality rates on Michigan roads. Automated vehicles can help push those rates lower than anyone could have imagined, truly "Toward Zero Deaths."

So what is MDOT doing to prepare for a future with automated vehicles? Plenty! Automated vehicles are expected to use and be enhanced by the Connected Vehicle technology being researched, tested and deployed across the country, especially here in Michigan. The ability to "talk" with other vehicles directly, and the ability to "talk" with a smart road infrastructure, is expected to supplement information generated by a vehicle's on-board automated systems, enhancing the overall

automated driving environment. So as MDOT continues to be a national leader in the development in Connected Vehicle technology, we are laying the groundwork for a future with automated vehicles.

There is a huge economic opportunity for companies in Michigan to take advantage of the research and development of automated vehicle systems. The same companies and partnerships that were developed to advance the Connected Vehicle program are working on developing and promoting automated vehicle technology. Additionally, there is a large base of technology companies in Michigan that support federal agencies, such as the Department of Defense, that are working on the development of automated technologies. MDOT and the Michigan Secretary of State's Office have worked with legislative staff on developing legislation that will permit the testing, and eventual operation, of automated vehicles on public roadways in Michigan.

Currently, a key piece of legislation, Senate Bill 169, sponsored by Senator Mike Kowall from Oakland County, has passed through the Senate Transportation Com-

mittee and is before the full Senate for a vote. Once passed, this legislation will allow not just automotive manufacturers, but automotive suppliers and technology companies, to test automated vehicle systems on public roadways. It also will provide the groundwork for the future of automated vehicles on roads and highways in Michigan.

MDOT also is working with several organizations, including research institutions, federal agencies and private technology and commercial trucking firms, to establish a test bed for "real life" testing and operation of automated vehicle technologies on commercial vehicles. While currently only in the concept stage, several commercial vehicle manufactures and supply companies have expressed their desire to work with Michigan to use this potential "test bed."

In most aspects of life, technology is changing at a blistering speed. The same holds true for transportation. We look forward to, and are excited about, the future of transportation as the technology that has only existed in movies is developed and deployed right in front of us. □

Superior Region Road Weather Information System

By: Dawn Gustafson, P.E. Superior Region Traffic & System Operations Engineer



In Michigan's Upper Peninsula (U.P.) winter weather can, and often does, mean major impacts to motorists. Lake effect snow, high winds and ice formation make for difficult driving conditions and road closures. However, given the rural nature across much of the U.P. and long distances between monitored maintenance locations, identification of poor road conditions and the need for closure can be difficult and time consuming. Furthermore, options for notifying motorists are limited.

To improve the ability to forecast and monitor road conditions, as well as inform motorists of conditions and closures, in 2007 the Michigan Department of Transportation (MDOT) deployed the first phase of a Road Weather Information System (RWIS). By 2008, five Environmental Sensor Stations (ESS) were constructed and operational, followed by eight more in 2009.

ESS typically include frost-depth sensors, cameras providing real-time images >>

of current conditions, atmospheric sensors which provide data to the National Weather Service for local forecasting, pavement sensors that predict freezing conditions and traffic speed/volume detectors.

In 2011, MDOT hired NorthWest Weathernet Inc. to evaluate proposed locations for future ESS and assist with the design of each site. Some of the key elements utilized in ESS location selection included distance from a maintenance facility, weather impacts in the area and availability of other weather data.

In 2012, MDOT hired Motor City Electric to install 16 additional ESS towers throughout the region. In December 2012, Lufft began installation of environmental sensors on those towers. As part of this contract several new technologies are being installed.

Microwave vehicle detectors (MVDS) will be installed in place of puck-style in-pavement sensors. The MVDS will allow the collection of traffic data from multiple lanes with one non-invasive unit, which will not need to be replaced with road resurfacing projects.

Non-invasive surface condition and pavement temperature sensors will also be used. These sensors only require recalibration after road resurfacing where invasive style sensors used at previous ESS locations require removal and reinstallation before and after road resurfacing projects.

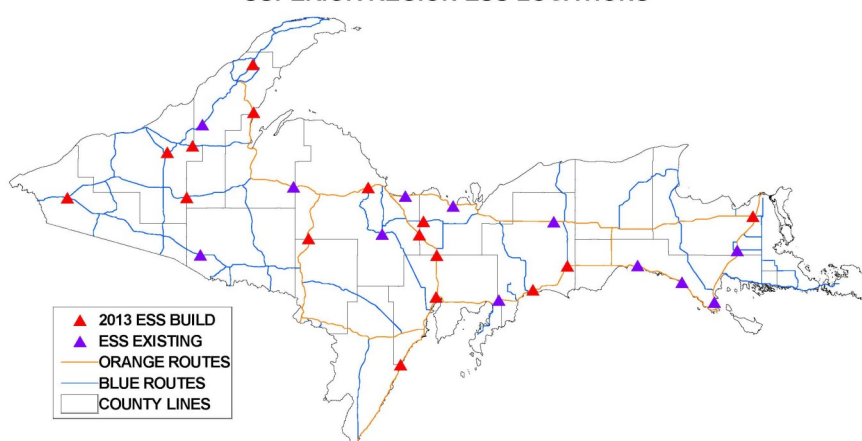
All new stations will be equipped with remote power cycling capabilities to assist with routine maintenance and trouble shooting. New cameras with no moveable parts will also help reduce the amount of onsite routine maintenance.

Where at all possible, new locations will

also share power with existing ITS infrastructure, such as dynamic message signs (DMS), to save on construction and operational costs. Along with the 16 new traditional sites, three sites will be installed at existing signal locations. These sites will include cameras, traffic detectors and pavement sensors. These sites will share existing power and communications with traffic signal equipment.

Installation at the new sites will resume in May when weather conditions permit work in the pavement. All stations should be operational this summer and be ready for use by winter maintenance crews during the 2013-2014 winter season. □

SUPERIOR REGION ESS LOCATIONS



West Michigan Transportation Operations Center

By: Suzette Peplinski, P.E. Grand Region Traffic Safety & Operations Engineer

Since 2006, the West Michigan Transportation Operations Center's (WMTOC) operations have focused on MDOT's goals of incident management, crash reduction, customer information, and congestion

reduction. The TOC provides motorists and businesses with real-time traffic information and partners with emergency response agencies to provide improved response to traffic crashes, saving lives, time, and money.

In 2010, the TOC relocated to a renovated control room space in MDOT's Grand Region office. Last year, the WMTOC was involved with over 1200 unplanned traffic events on west Michigan roadways. Approximately 700 of these were crashes.

The TOC also works with local partners to

support construction and special events. Approximately 612 construction messages and 48 special events messages were placed in 2012.

The Grand Rapids area ITS includes a vehicle detection system which covers segments of the core freeways in Grand Rapids (primarily US-131, I-96, and I-196). This system provides traffic counts and speeds for the freeways to provide congestion, incident, and travel time information to the TOC and to the Mi Drive Web site. This data is also available as historical data for operational analysis. >>



Arterial ITS

The WMTOC camera coverage area has expanded to include portions of M-11 (28th Street) and M-37 (Alpine and Broadmoor avenues), which incorporates 16 cameras and 19 miles of MDOT arterial trunklines. This camera coverage of local trunklines, along with city and counties cameras that the TOC has access to, also allows TOC operators to monitor crucial links within the roadway network, providing coverage of emergency management routes that are needed to sup-

port traffic diverted off the freeway because of a crash or an emergency.

The TOC works closely with the city of Grand Rapids Police Department and Traffic Management Center on incident management route implementation and to support downtown Grand Rapids special-event traffic management plans.

Monthly and annual WMTOC performance reports can be found by going to www.michigan.gov/its and clicking on "West Michigan." □

MDOT Expands Freeway Courtesy Patrol to Brighton Area

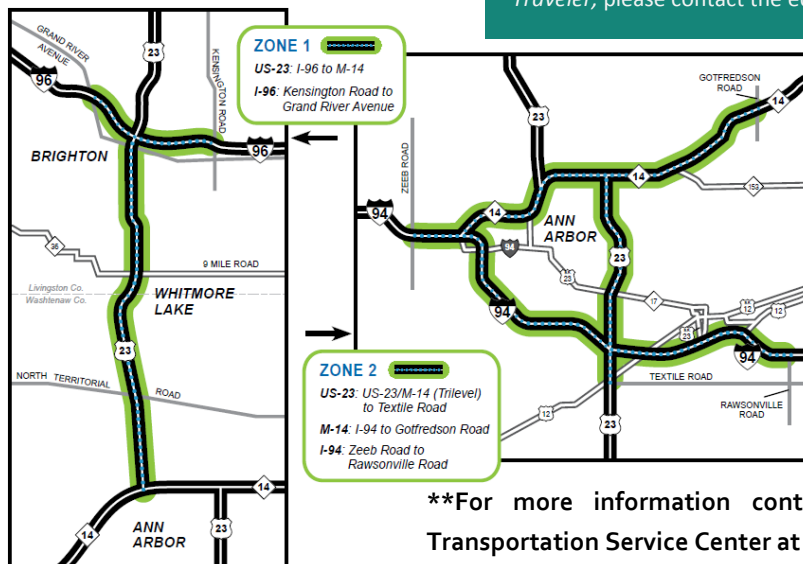
By: Jennifer Foley, University Region Traffic & Operations Engineer

This past winter, the Michigan Department of Transportation (MDOT) expanded the use of the Freeway Courtesy Patrol (FCP) on select freeways in Livingston and Washtenaw counties, including US-23, I-96, I-94 and M-14. The FCP program is part of MDOT's larger freeway incident management system that is designed to improve motorist safety and reduce travel times.

FCP drivers are notified of motorists needing assistance in several ways. MDOT staff monitors traffic cameras on freeways at locations such as the Statewide Transportation Operations Center in Lansing, while local law enforcement observes stranded motorists and calls into the local dispatch. FCP drivers also make regular patrols in their designated areas looking for motorists needing help. FCP service is free and drivers are not allowed to accept any compensation for their assistance.

Assistance by FCP drivers includes:

- Servicing disabled vehicles by providing fuel, oil, and other system fluids;
- Clearing stranded vehicles and debris from driving lanes;
- Changing or inflating tires; making minor mechanical repairs; securing the area around your vehicle;
- Removing disabled vehicles;
- Providing cell phone assistance;
- Transporting stranded motorists; and
- Providing directions.



Upcoming Events

**MON-TUE
15-16**

APR

ITE Great Lakes District 2013 Annual Meeting

Amway Grand Plaza Hotel
187 Monroe Ave NW
Grand Rapids, MI 49503

*Featuring ITS Michigan
Vendor Showcase

**TUE-THU
16-18**

APR

SAE World Congress and Exhibition

Cobo Center
1 Washington Boulevard #401
Detroit, MI 48226

**MON-WED
22-24**

APR

23rd ITS America Annual Meeting

Gaylord Opryland Resort and
Convention Center
2800 Opryland Dr.
Nashville, TN 37214

**TUE
14**

MAY

ITS Michigan 2013 Annual Meeting

The Rackham Building (UMTRI)
915 E Washington St.
Ann Arbor, MI 48109

**TUE-THU
14-16**

MAY

Global Symposium on Connected Vehicles and Infrastructure

The Rackham Building (UMTRI)
915 E Washington St.
Ann Arbor, MI 48109

*If you have an event or an article that you would like included in future editions of *The Intelligent Traveler*, please contact the editorial staff.

****For more information contact the Brighton
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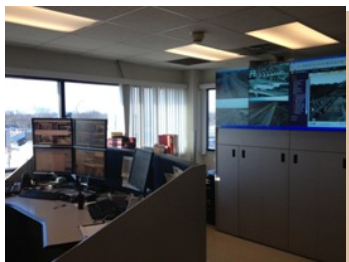
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